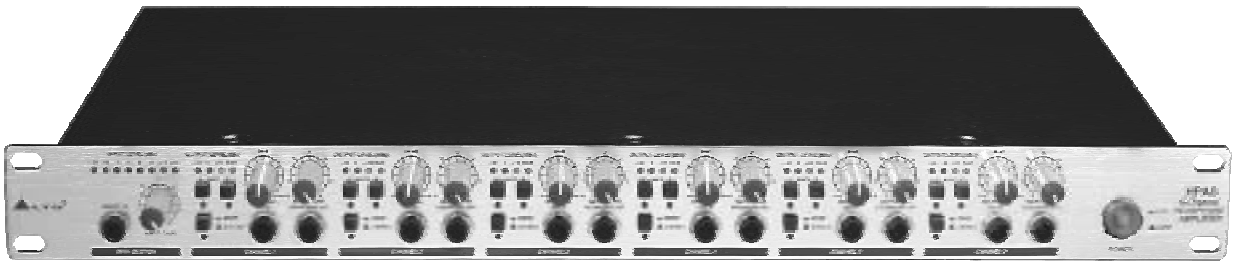
# User's Manual

# HPA6

## 6-Channel HEADPHONE AMPLIFIER



ALTO®

www.altoproaudio.com

Version 1.0 April 2002

— **English** —

## SAFETY RELATED SYMBOLS

This symbol, wherever it appears, alerts you to the presence of uninsulated dangerous voltage inside the enclosure-voltage that may be sufficient to constitute a risk of shock.

This symbol ,wherever it appears ,alerts you to important operating and maintenance instructions in the accompanying literature . Read the manual .

⏚ Protective grounding terminal .

~ Alternating current /voltage .

ϟ Hazardous live terminal .

**ON:** Denotes the apparatus turns on .

**OFF:** Denotes the apparatus turns off ,because of using the single pole switch ,be sure to unplug the AC power to prevent any electric shock before you proceed your service .

**WARNING:** Describes precautions that should be observed to prevent the danger of injury or death to the user .

**CAUTION:** Describes precautions that should be observed to prevent danger of the apparatus .

## WARNING

- **Power Supply**

  Ensure the source voltage matches the voltage of the power supply before turning ON the apparatus.
  Unplug this apparatus during lightning storms or when unused for long periods of time .

- **External Connection**

  The external wiring connected to the output hazardous live terminals requires installation by an instructed person, or the use of ready-made leads or cords.

- **Do not Remove any Cover**

  There are maybe some areas with high voltages inside , to reduce the risk of electric shock, do not remove any cover if the power supply is connected.
  The cover should be removed by the qualified personnel only.
  No user serviceable parts inside.

- **Fuse**

  To prevent a fire, make sure to use fuses with specified standard (current, voltage, type). Do not use a different fuse or short circuit the fuse holder.
  Before replacing the fuse, turn OFF the apparatus and disconnected the power source.

- **Protective Grounding**

  Make sure to connect the protective grounding to prevent any electric shock before turning ON the apparatus.
  Never cut off the internal or external protective grounding wire or disconnect the wiring of protective grounding terminal.

- **Operating Conditions**

  This apparatus shall not be exposed to dripping or splashing and that no objects filled with liquids, such as vases, shall be placed on this apparatus.
  To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture.
  Do not use this apparatus near water.
  Install in accordance with the manufacturer's instructions. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
  Do not block any ventilation openings.
  No naked flame sources, such as lighted candles, should be placed on the apparatus.

## IMPORTANT SAFETY INSTRUCTIONS

- Read these instructions.
- Follow all instructions.
- Keep these instructions.
- Heed all warnings.
- Only use attachments/accessories specified by the manufacturer.

- **Power Cord and Plug**

  Do not defeat the safety purpose of the polarized or grounding type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
  Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles , and the point where they exit from the apparatus.

- **Cleaning**

  When the apparatus needs a cleaning, you can blow off dust from the apparatus with a blower or clean with rag etc. Don't use solvents such as benzol, alcohol, or other fluids with very strong volatility and flammability for cleaning the apparatus body.
  Clean only with dry cloth.

- **Servicing**

  Refer all servicing to qualified personnel. To reduce the risk of electric shock, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so .
  Servicing is required when the apparatus has been damaged in any way ,such as power supply cord or plug is damaged , liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

## Preface

Dear Customer:

Thanks for choosing ▲LTO HPA6 6-Channel Headphone Amplifier and thanks for choosing the one of results of ▲LTO AUDIO TEAM job and researches.

For our ▲LTO AUDIO TEAM, music and sound are more than a job…are first of all passion and let us say… our obsession!

We have been designing professional audio products for a long time in cooperation with some of the major brands in the world in the audio field.

The ▲LTO line presents unparalleled analogue and digital products made by Musicians for Musicians in our R&D Centres in Italy, Netherlands, United Kingdom and Taiwan. The core of our digital audio products is a sophisticated DSP (Digital sound processor) and a large range of state of the art algorithms which have been developed by our Software Team for the last 7 years.

Because we are convinced you are the most important member of ▲LTO AUDIO TEAM and the one confirming the quality of our job, we'd like to share with you our work and our dreams, pay attention to your suggestions and your comments.

Following this idea we create our products and we will create the new ones! From our side, we guarantee you and we will guarantee you also in future the best quality, the best fruits of our continuous researches and the best prices.

Our ▲LTO HPA6 6-Channel Headphone Amplifier is the result of many hours of listening and tests involving common people, area experts, musicians and technicians.

The result of this effort is a versatile Headphone Amplifier featuring 6 separated channels, each channel provides 3 push-button switches, 2 knob controls, 2 phone jacks and 4 LEDs . The common main section contains 1knob control, 1 jack and 8 LEDs.

Nothing else to add, but that we would like to thank all the people that made the ▲LTO HPA6 6-Channel Headphone Amplifier a reality available to our customers, and thank our designers and all the ▲LTO staff, there to make possible the realization of products containing our idea of music and sound and there to support you, our customers, in the best way, conscious that you are our best richness.

Thank you very much.
▲LTO AUDIO TEAM

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## 1. Introduction

Thank you very much for expressing your confidence in ▲LTO products by purchasing our HPA6 6-Channel Headphone Amplifier. With the HPA6 you have acquired an extremely musical and flexible 6-Channel Headphone Amplifier. Featuring six stereo headphone amplifiers, The ▲LTO HPA6 6-Channel Headphone Amplifier performs a number of necessary tasks, not all of which are headphone related.

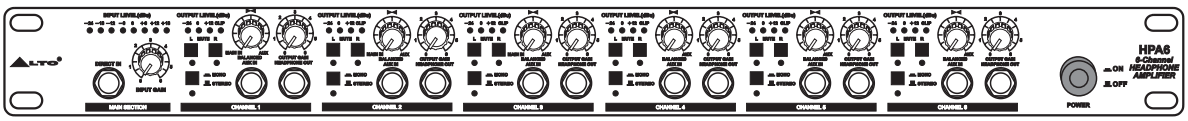
The HPA6 6-Channel Headphone Amplifier provides Main Inputs on the rear panel and Direct In Input on the front panel to drive any or all of the 6 stereo headphone amplifiers, when using the Direct In Input, the Main Inputs signal will be interrupted automatically, the Main Outputs on the rear panel can be used to interlink any number of HPA6s for expanding. The AUX In input on each channel is used to add an additional input signal to the master signal, with the corresponding Balanced Control to determine the mix ratio between the two signals.

The Headphone Out outputs on the front panel is connected in parallel to the rear panel output connectors, and provides an additional option to monitor the individual channels, esp. in the Rack mounting application.

## 2. Feature List

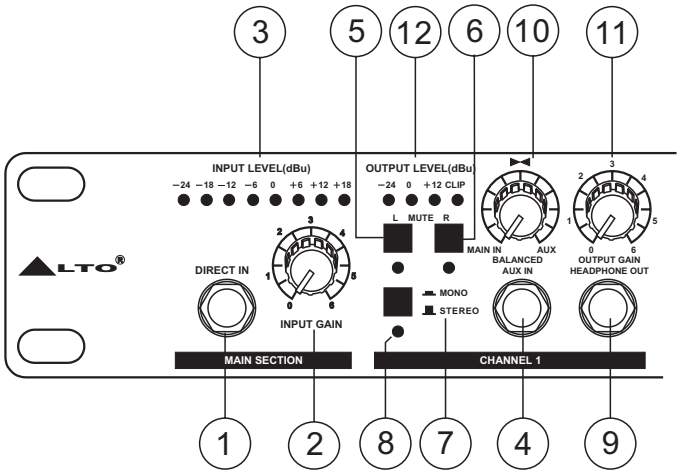
- Signal Rack Unit
- Exceptionally rugged construction ensures long life and durability
- Professional , universal headphone amplification system for studio and stage
- 6 individual stereo high-power amplifiers
- Maximum audio quality even at high volume levels
- Stereo AUX In per channel for additional signal source
- 6 independent input mix sections
- Output level control per channel
- Mono and LEFT/RIGHT MUTE buttons per channel for additional flexibility
- 3 headphone outputs per channel on front and rear panels
- Precise 4-digit LED output level display per channel
- Direct In on the front panel for additional stereo signal source
- Paralleled main outputs to chain several HPA6 headphone amplifiers
- Servo-balanced , gold-plated XLR and 1/4" TRS connectors
- Manufactured Under ISO9001 Certified management system

## 3. Control Elements



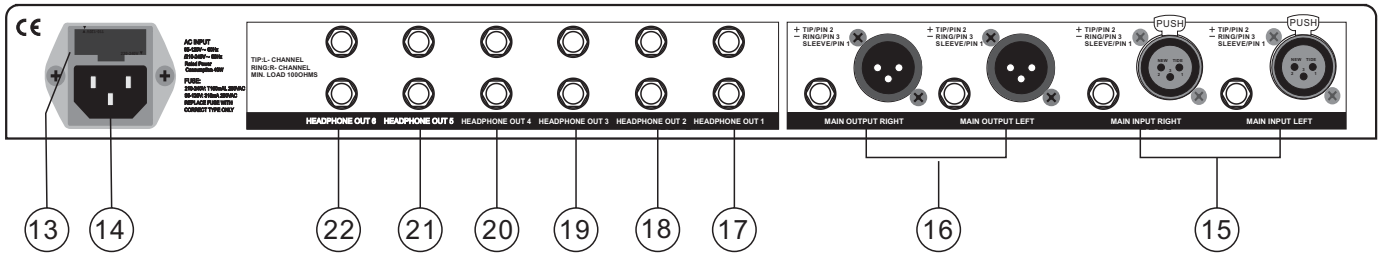

The ▲LTO HPA6 6-Channel Headphone Amplifier has six separated channels, each channel presents 3 Push-button switches, 2 knob controls , 2 phone jacks and 4 LEDs. The common main section contains 1 knob control,1 jack and 8 LEDs.

3.1 The Front Panel




1. **Direct In Input:** The Direct In Input is used to feed the signals coming from an external source. While using the Direct In Input, the Main signal applied on the rear panel is interrupted automatically.
2. **Input Gain Control:** This control sets the input signal level coming from Main/Direct In.
3. **Input Level Meter:** This 8-digit Input Level Meter informs you about the input signal level within a range from -24dBu to +18dBu.
4. **Aux In Input:** The Aux In Input is used to feed the further input signal, which can be mixed with the Main/ Direct In signal via Balanced Control.
5. **L Mute Switch:** This push-button mutes the Left input signal.
6. **R Mute Switch:** This push-button mutes the Right input signal.
7. **Mode Switch:** This push-button switches the operational mode between Mono and Stereo. Press this button for Mono application, and the Mono LED (8) lights up.
8. **Mono LED:** This LED informs you the current operational mode. Press the Mode Switch(7) for Mono application, this LED lights up.
9. **Headphone Out Output:** This 1/4" TRS phone jack is connected in parallel to the rear panel output connectors, and provides an additional option to monitor the individual channels. When this unit is permanently installed in rack, this proves to be a useful function.
10. **Balanced Control:** This control sets the proportion between the Main/Direct In signal and the input signal applied to Aux In Input.
11. **Output Gain Control:** This control sets the volume of the individual channels and refers to both the Left & Right Channel and the Headphone Out.
12. **Output Level Meter:** This 4-digit Output Level Meter informs you about the output signal level within a range from 24dBu to +12dBu. If the Clip LED lights up, you should turn down the Input Gain Control or/and the individual Output Gain Control (only for the Channel incurs Clip) to avoid any distortion.

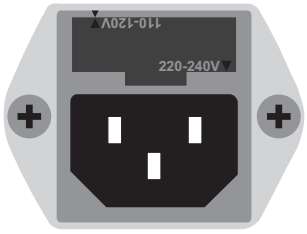
3.2 The Rear Panel



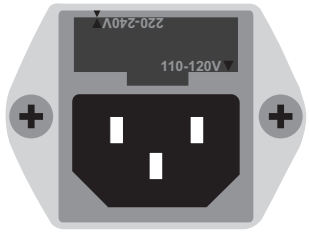
**13. Fuse holder / Voltage selector**

This is a dual voltage unit. Before you attempt to connect and operate the unit, please make sure that your local voltage matches the voltage on the fuse-holder cover.

**Caution:** The fuse protecting the AC supplies circuits of this unit. The fuse can only be changed by a qualified technician, in the event of a fault or changing the supply voltage. If the fuse continues to blow after replacing, discontinue use of this unit before repaired.




THIS IS SET FOR
110V AC TO 120V
AC OPERATION




THIS IS SET FOR
220V AC TO 240V
AC OPERATION

The fuse-holder above the AC connector on the rear of the chassis has 3 triangular markers(please refer to the above pictures), with two of these triangles opposing each other, your unit is set to the operating voltage printed next to these markers.

To change, pull fuse-holder out and rotate 180°,then push in again.

**14. AC Inlet**

This connector is meant for the connection of the supplied main cord. Do not insert power cable into unit until voltage has been correctly set. Do not plug power cable into AC power until voltage has been correctly set.

**15.Main Input Connectors:** These connectors are used to input the stereo signal. You can input the main signal via the balanced 1/4" TRS phone jack or XLR connector.

**16.Main Output Connectors:** These connectors are used to output the stereo signal. You can output the main signal via the balanced 1/4" TRS phone jack or XLR connector. In some typical field, you can also use these connectors to interlink several Headphone Amplifiers.

**17.Headphone Out1:** In Parallel with the Headphone Out on the front panel (for Channel 1), these are the headphone outputs of Channel 1.

**18.Headphone Out2:** In Parallel with the Headphone Out on the front panel (for Channel 2), these are the headphone outputs of Channel 2.

**19.Headphone Out3:** In Parallel with the Headphone Out on the front panel (for Channel 3), these are the headphone outputs of Channel 3.

**20.Headphone Out4:** In Parallel with the Headphone Out on the front panel (for Channel 4), these are the headphone outputs of Channel 4.

**21.Headphone Out5:** In Parallel with the Headphone Out on the front panel (for Channel 5), these are the headphone outputs of Channel 5.

**22.Headphone Out6:** In Parallel with the Headphone Out on the front panel (for Channel 6), these are the headphone outputs of Channel 6.

## 4. Installation & Connection

### 4.1 Mains Connection

This is a dual voltage unit. Please ensure that the ▲LTO HPA6 6-Channel Headphone Amplifier is set to the correct supply voltage before plugging the power cord into the wall outlet, use the same fuse as marked on the fuse holder at the AC power connection socket.

Do not insert power cable into the unit until voltage has been correctly set. Do not plug the power cable into AC power until voltage has been correctly set.

The mains connection of the ▲LTO HPA6 6-Channel Headphone Amplifier is made by using the enclosed mains cable and a standard IEC receptacle. It meets all of the international safety certification requirements.

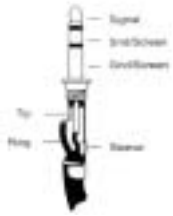
### 4.2 Audio Connection

The HPA6 6-Channel Headphone Amplifier presents with balanced XLR connectors and 1/4" TRS phone jack and it can be interfaced by several ways to support a variety of applications without any signal loss.

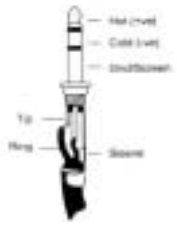
**a. Wiring Configuration**

Either the 1/4" TRS (Tip-Ring-Sleeve) phone jack or the XLR servo connector can be wired in balanced and unbalanced modes, which will be determined by the actual application status, Please wire your systems as the following examples:

• For 1/4" TRS jack

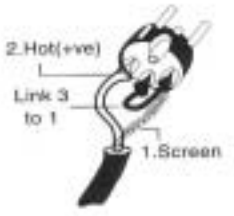


1/4"TRS jack
Unbalanced input

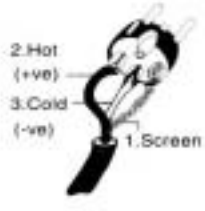


1/4"TRS jack
Balanced input

• For XLR connector




XLR Unbalanced input

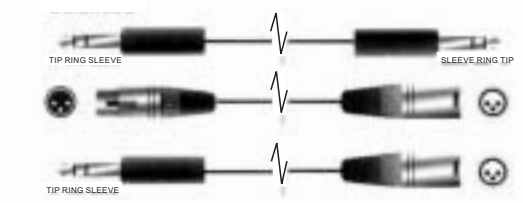


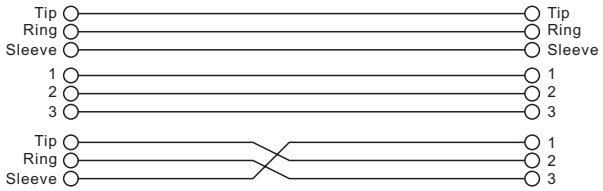

XLR Balanced input

**b. In Line Connection**

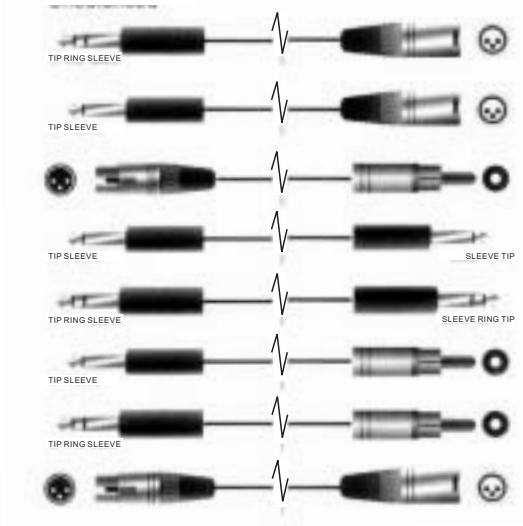
For these applications, the HPA6 6-Channel Headphone Amplifier provides XLR connectors and 1/4" TRS phone jack to easily interface with most professional audio devices. Follow the configuration examples below for your particular connection.

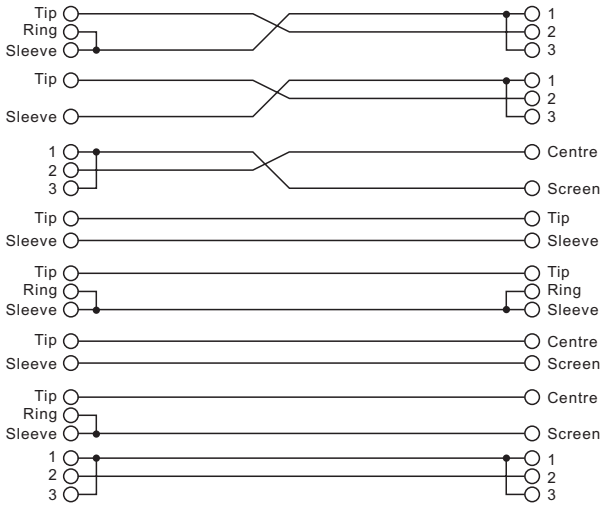
• Balanced




• Unbalanced




### 4.3 Rack Mounting

The most secure mounting is on a universal rack shelf available from various rack manufactures or your music dealer. The HPA6 6-Channel Headphone Amplifier fits into one standard 19" rack unit of space. Please allow at least an additional 4" depth for the connectors on the rear panel. Be sure that there is enough air space around the unit for sufficient ventilation and please do not place the HPA6 6-Channel Headphone Amplifier on high temperature devices such as power amplifiers etc. to avoid overheating.

## 5.Application

This section presents some typical applications of our ▲LTO HPA6 6-Channel Headphone Amplifier. Please reserve your time to well understand the control elements ( see Chapter 3 ) and the following application examples, so as to be able to fully exploit the HPA6 6-Channel Headphone Amplifier.

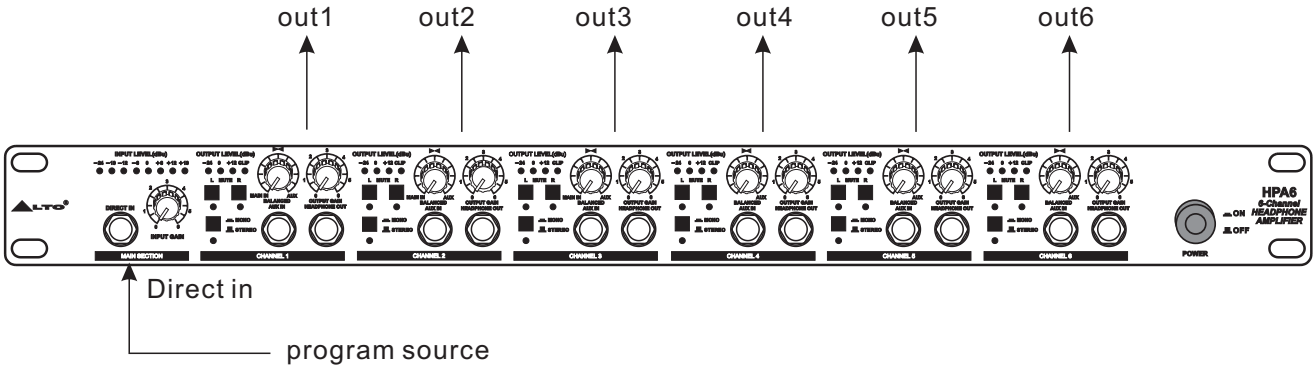
### 5.1 The HPA6 as a Headphone Amplifier

This is the basic application for HPA6 6-Channel Headphone Amplifier. While using the HPA6 as a Headphone Amplifier, please apply the program source to Main / Direct In Inputs, and connect the headphone cable to one of the appropriate outputs. Turn up the Input Gain and the Balanced controls to center position. The Input Gain control is used to boost or attenuate the general volume of all the headphones, while the individual Output Gain controls are used to set the desired channel volume.

Three headphones can be connected per channel each time, on condition that the resulting total connection impedance does not fall below 100 Ohms (Although the power amplifiers are resistant to temporary short circuits, an impedance drop will not incur any damage, but, it can affect the quality of reproduction, in terms of long term damage and distortion). If this is not enough, you can interlink any number of HPA6 via the Main Outputs.

The Headphone Out on the front panel is connected in parallel to the rear panel output connectors, and it provides an additional option to monitor the individual channels. When this unit is permanently mounted in the rack, this proves to be a useful function.

In some typical fields, the Direct In Input is more preferable. For example, it is often necessary to replay a song for the performer in the stage, this can be easily and rapidly done via this Direct In jack even if in the rack installation condition.

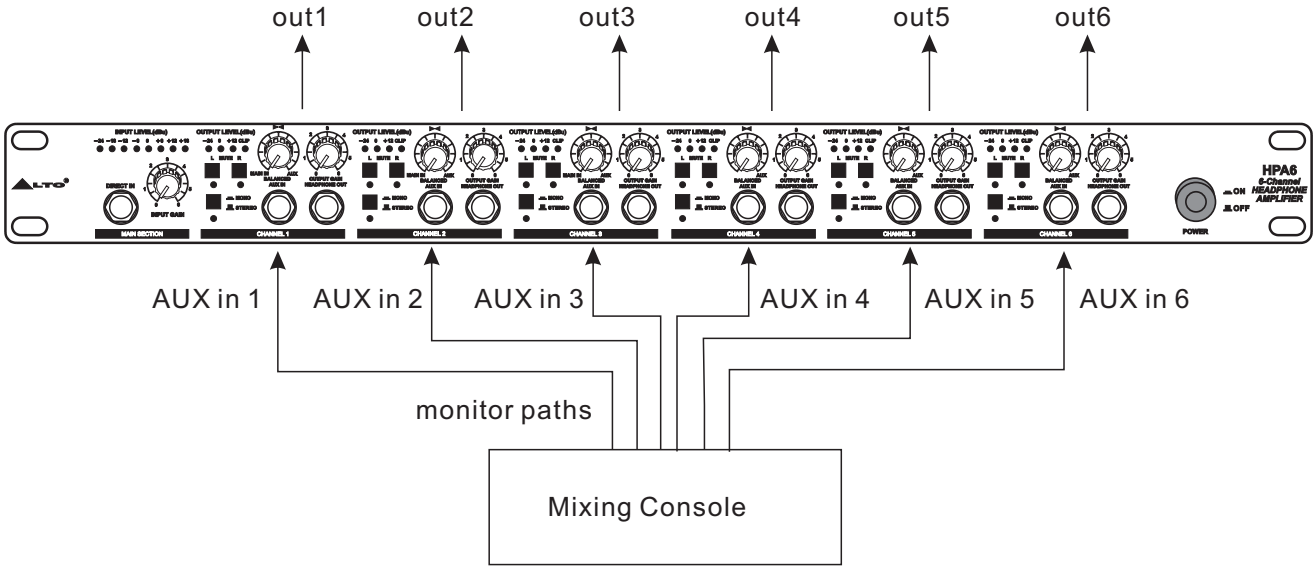



## 5.2 The HPA6 as Independent Power Amplifiers

In addition to use the HPA6 as the Headphone Amplifier, each of the 6-Channel's power amplifiers can also be used independently. The Aux In Inputs in combination with the Balanced Control serve this application.

If the Balanced Control is set to "Aux" position (clockwise stop position), the Main signal is muted, only the signals coming from Aux In Input are routed to the power amplifier.

By configuring the HPA6 as completely independent power amplifiers, you can insert up to six independent stereo program sources, thus, six different and individual mixes for up to six musicians can be created. As with a stage monitor system, you can give each musician a specific configuration of instruments and create a personal mix for him or her that is musically inspiring. Or you can establish different signal paths for the interpreters in a conference system. Configure sub-groups or create pre-mixes using the effects and/or monitor facilities of your mixing console. Set the Balance Control to "Aux" position and connect the Aux In Inputs of the HPA6 to the corresponding monitor, sub-group or single output of the console.

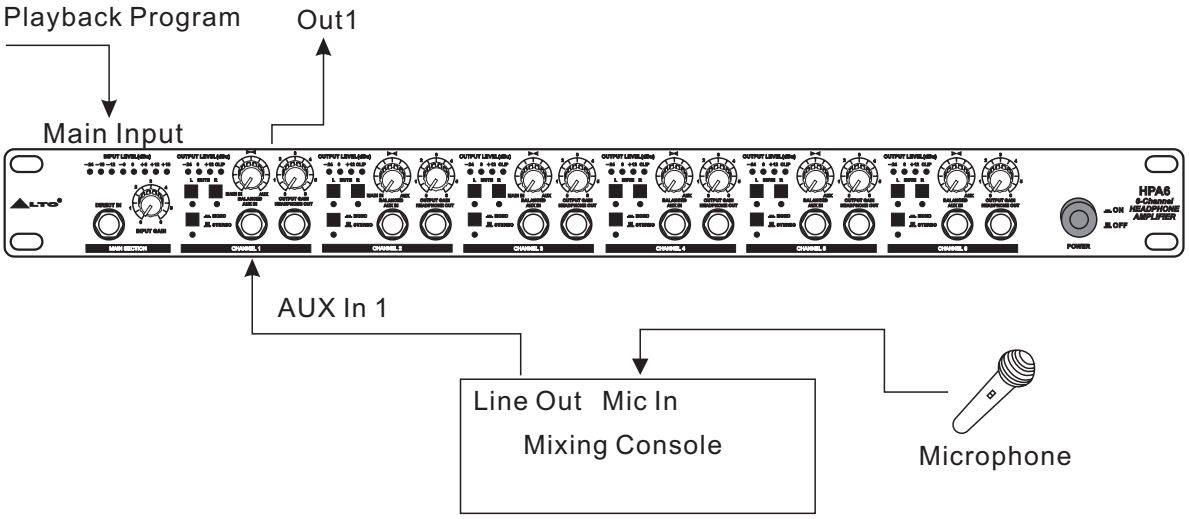



## 5.3 The HPA6 in Studio Application

Basically, the Aux In Inputs are used to feed a further input signal, which can be mixed with the Main/ Direct In signal via Balanced Control. The Balanced Control supersedes the previously required monitor mixer and allows for an application that is frequently used in Studio field.

Typical example : Suppose a vocalist wants to record a vocal track that is to be added to already existing instrumental tracks. Up to mow, it has been common practice that the vocalist listens to the playback by pressing a headphone pad against one ear, while controlling his/her own voice with the another free ear.

This kind of application may be obsolete if you come with the ▲LTO HPA6 6-Channel Headphone Amplifier. Insert the playback signal via the Main Inputs, and apply the preamplifiered vocal signal to Aux In. The Balanced Control is adjusted so that the vocalist can hear a pretty perfect mix of both backing tracks and vocals, with the Output Gain Control to determine the overall volume level.




### 5.4 The HPA6 in Mono / Stereo Application

The HPA6 6-Channel Headphone Amplifier can be switched between the Mono and Stereo operational mode via Mode Switch control. Press the Mode Switch for Mono application, the Mono LED (8) lights up. In Mono application, the input two signals are combined together and the resulting mono signal routes to both the Left and Right Headphone Out Outputs.

## 6. Technical Specifications

**AUDIO INPUT**

MAIN input

| | |
|---|---|
| Connectors | XLR and 1/4" jack |
| Type | RF filtered, servo balanced input |
| Impedance | 50 kOhms balanced, 25 kOhms unbalanced |
| Max.input level | +21 dBu balanced and unbalanced (unity gain) |
| CMRR | typ.40 dB, >55 dB @ 1kHz |

AUX IN and DIRECT IN input

| | |
|---|---|
| Connectors | 1/4" jack (tip=left, ring=right, sleeve=ground) |
| Type | unbalanced |
| Impedance | 25 kOhms unbalanced |
| Max.input level | +21 dBu unbalanced (unity gain) |
| CMRR | typ,40 dB, >55 dB @ 1 kHz |

**AUDIO OUTPUT**

| | |
|---|---|
| Connectors | XLR and 1/4" jack |
| Type | balanced /unbalanced |
| Impedance | dependent on input balance |
| Max. output level | +21 dBu balanced and unbalanced |

**SYSTEM SPECIFICATIONS**

| | |
|---|---|
| Frequency response | 10Hz to 50kHz,+/-3dB |
| S/N | >90dB, unweighted, 22 Hz to 22kHz |
| THD | 0.005% typ.@+4 dBu, 1kHz, Gain 1 |

**POWER AMPLIFIER**

| | |
|---|---|
| Max.output power | +21dBm |
| Min.output impedance | 100Ohms |
| Max.gain | +20dB |

**FUNCTION CONTROLS**

| | |
|---|---|
| Input level | variable |
| Balanced per channel | mix between aux and main signal |
| Output level per channel | variable |

**FUNCTION SWITCHES**

| | |
|---|---|
| Left mute | mutes the left signal of this channel |
| Right mute | mutes the right signal of this channel |
| Mode | switches channel to mono/stereo |

**INDICATORS**

| | |
|---|---|
| Input level | 8-digit LED display: -24/-18/-12/-6/0/+6/+12/ +18dBu |
| Output level | 4-digit LED display: -24/0/+12 dBu/CLIP |

**POWER SUPPLY**

| | |
|---|---|
| Connector type | 3-pole IEC, grounded |
| Type | Servo controlled, stabilized |
| Mains supply | 95-120V～ /210-240V～,60-50Hz |
| Power Rating | 40 W |
| Fuse | 210-240V: T160mAL 250VAC<br>95-120V: 315mA 250VAC |

**PHYSICAL**

| | |
|---|---|
| Dimension | 483(W)× 217(D)× 44(H)mm(19"× 8.54"× 1.7") |
| Net weight | 2.9kg(6.39lb) |

## 7. WARRANTY

### 1. WARRANTY REGISTRATION CARD

To obtain Warranty Service, the buyer should first fill out and return the enclosed Warranty Registration Card within 10 days of the Purchase Date.

All the information presented in this Warranty Registration Card gives the manufacturer a better understanding of the sales status, so as to purport a more effective and efficient after-sales warranty service. Please fill out all the information carefully and genuinely, miswriting or absence of this card will void your warranty service.

### 2. RETURN NOTICE

2.1 In case of return for any warranty service, please make sure that the product is well packed in its original shipping carton, and it can protect your unit from any other extra damage.

2.2 Please provide a copy of your sales receipt or other proof of purchase with the returned machine ,and give detail information about your return address and contact telephone number .

2.3 A brief description of the defect will be appreciated.

2.4 Please prepay all the costs involved in the return shipping, handling and insurance.

### 3. TERMS AND CONDITIONS

3.1 ▲LTO warrants that this product will be free from any defects in materials and/or workmanship for a period of 1 year from the purchase date if you have completed the Warranty Registration Card in time.

3.2 The warranty service is only available to the original consumer, who purchased this product directly from the retail dealer, and it can not be transferred.

3.3 During the warranty service,▲LTO may repair or replace this product at its own option at no charge to you for parts or for labor in accordance with the right side of this limited warranty.

3.4 This warranty does not apply to the damages to this product that occurred as the following conditions:

- Instead of operating in accordance with the user's manual thoroughly, any abuse or misuse of this product.
- Normal tear and wear.
- The product has been altered or modified in any way.
- Damage which may have been caused either directly or indirectly by another product / force / etc
- Abnormal service or repairing by anyone other than the qualified personnel or technician.

And in such cases, all the expenses will be charged to the buyer.

3.5 In no event shall ▲LTO be liable for any incidental or consequential damages. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above exclusion or limitation may not apply to you.

3.6 This warranty gives you the specific rights, and these rights are compatible with the state laws, you may also have other statutory rights that may vary from state to state.